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The Prevention of Poultry Diseases.*

By Capt. J. P. RICE, B.Sc., M.R.C.V.S.,
Head of the Animal Diseases Division, Ministry of Agriculture, Belfast.

The frequency with which poultry diseases are referred to in our press is at once evidence of their importance and of the necessity for their control. Poultry suffer more from disease than any other domesticated animals, and I propose in this paper to discuss why this is so and to suggest to you certain measures whereby losses can be reduced. The suggestions I shall make are, in my opinion, capable of practical application, and have, in fact, been applied with success. The problem will be examined with reference to modern methods of poultry husbandry, but the treatment of individual diseases will not be discussed.

The best insurance against disease is the bird of sound constitution which is properly bred and managed. Scientific investigations are necessary that we may know how to obtain and maintain the healthy animal, but the major part must be played by the poultry farmer himself.

The popular demand to-day seems to be for preventive agents which will safeguard against disease birds, which, by reason of breeding and management for heavy egg production, are susceptible. In response to that demand there has grown up a considerable trade in quack remedies and an inconsiderable trade in vaccines and serums. The former deserve but scant attention in that the value of the large majority of them has not been proved. Purchasers are led to believe that good will result from their use alone, and valuable methods of control are neglected.

It is convenient to refer here to internal disinfectants which are so freely advised in the prevention of contagious diseases of poultry. Let me say at once that I am unaware of any carefully-controlled experiments which prove the value of those now available. Their only merit is for the poultry farmer himself who believes he is doing something; too frequently he is encouraged in that belief by advisers on disease. Corrosive sublimate, for example, has been used as a means of controlling diseases such as Bacillary White Diarrhœa, but without success. I know that two distinguished American veterinarians state in their text book that the drug was administered to fowls in watery solution of strengths varying from 1 in 2,000 to 1 in 6,000, without apparent ill-effect—you will note the word "apparent"—but there is no mention of any detailed *post-mortem* examination of the birds. Corrosive sublimate, when ingested, corrodes the delicate lining of the food tract, combining with albumen, and, as an albuminate, is carried in the blood stream to other organs in which it is stored and from which it is only slowly excreted. Birds are more susceptible than any other animals to poisoning by mercury salts, and it is curious that they should be selected as victims of this dangerous treatment. We hear little of the harmful effects of the drug, because the losses which occur during its administration are assigned to the disease, but I can assure you that many outbreaks of bacillary white diarrhœa have been rendered more severe by its use.

Potassium permanganate is commonly added to the drinking water in amount sufficient to give a deep red solution, which corresponds to a strength of about 1 in 10,000. Even when freshly prepared the solution is incapable of killing, say, *Bacillus pullorum*, the causal organism of bacillary white diarrhœa. The drug depends for its disinfectant action on the release of oxygen, which combines with the germs of disease, but, in an open vessel and in the presence of organic matter so commonly contained in the water, it soon loses its power; the chief point about it is that it looks well.

Some of you may be aware of a lengthy discussion which took place recently regarding the value of vaccines and serums. I refer to the matter only because the final opinion, erroneous in my view, was expressed that these specific agents are not yet effective for poultry. A certain experiment carried out in America with roup vaccine, one of the many failures before success, was quoted and held to disprove the value of vaccination generally. While there is no vaccine against roup with a hundred per cent. efficiency, there are some which have preventive value and their use can be advised. More efficient vaccines are available against other poultry diseases, but the majority are not on the market. On the Continent and in America they are issued mostly by State Institutions to veterinarians who vaccinate on a big scale. In this country drugs are preferred, without regard to their efficiency, because they are easily administered and because influential journals have freely advertised their supposed value. While I ask you to believe that vaccines and other specific aids must play an important part in the campaign

* Read at the Eighth Annual Poultry Conference, Harper-Adams Agricultural College, 7th August, 1924.

against disease, they cannot play the whole part. They can never be more than valuable adjuncts in a system which should rely mainly on proper breeding and management.

Mention might be made here of two tests which are claimed to be of value. One of these is the intradermal test for tuberculosis, which is rarely used in this country. I recommend it to your notice as a valuable means of eradicating the disease in pedigree flocks if it is accompanied by clinical examination. The other test is the so-called blood test or agglutination test for bacillary white diarrhœa, which has been carried out on a large scale in this and other countries. While I think that it is the best test now available, and that, if properly carried out, it is capable of preventing the disease when coupled with other precautions, the technique and interpretation require further investigation. The disposal of reacting birds presents no little difficulty. We are told that reactors should not be used for breeding purposes, but only for the production of eggs for consumption. In my experience, up to 85 per cent. of a pedigree flock may react to the test and the permanent exclusion of that number of birds from the breeding pens must result in disaster for a farmer who has built up a valuable strain. No doubt the next speaker will tell you of methods whereby losses from the disease can be reduced, but may I just say that in a small way I have bred from hens, all of which reacted to the test, and that I have been surprised at the low mortality amongst the resulting chicks and at the small percentage of reactors amongst them when they reached adult stage. The parent hens were re-tested a year later, and some were found to be then non-reactors. You will thus see that the so-called carrier of bacillary white diarrhœa is not necessarily a carrier for life, and that this observation—a new one to me—permits of a more hopeful outlook for the valuable bird which reacts.

Now we pass to the major part, which I have said must be played by the poultry farmer himself.

Disease is a natural phenomenon, which serves the dual purpose of eliminating the weaker members of a species and of propagating the lowly forms of life which invade the body and cause disease. Anything in our methods of husbandry which weakens the individual bird increases susceptibility to disease and at the same time exalts the virulence of disease germs. Our task, then, is to determine what weakening influences are at work in poultry farming and how best we can avoid them. Undoubtedly high egg production is at the root of our many troubles with disease. We are just beginning to see its effects on ducks, which are now being selected in growing numbers for egg production, and amongst which, as evidenced by laying test reports, mortality is yearly increasing.

Even with our most-carefully-balanced rations there is a limit to the amount of food which a bird can ingest and utilise, the amount being regulated by the capacity of the digestive and other systems. When this maximum is reached, the increased function of any particular system is possible only at the expense of the rest of the body, which, though denied a part of its food supply, must work harder to support the particular system. Thus in high egg production the increased function of the generative organs is commonly associated with some measure of starvation of other organs. It may be that some part of the complicated defensive mechanism against disease breaks down under the strain of increased function and defective nutrition, and invasion by disease germs takes place, or the organs may continue to function imperfectly. Apparently normal eggs may continue to be produced, but when they are incubated they are found to be abnormal in fertility and hatchability; most of us know the thirty per cent. hatch obtained so commonly from high record birds. Poultry farmers insist that male birds must not be over-used, yet they cheerfully encourage hens to lay through the winter and then mate them up with the idea of obtaining many and vigorous chicks. Let us be more moderate in our demands for birds with high egg records, and when we select the parents, let us not choose those which "handle" well only in the pelvic region, but let us have regard to general development. All the organs in the body are interdependent, and the strain on one organ cannot be borne without the assistance of other well-developed and well-nourished organs.

While discussing breeding, I think it well to mention a subject which is frequently referred to by poultry farmers—the possibility of producing strains of poultry immune to disease. The inheritance of resistance to disease has received little attention from animal breeders, but important work has been done in plants, notably the experiments of Biffen with wheat. The subject raises many controversial points, including the inheritance of acquired characters, and it is not one on which I invite discussion. The ultimate solution of the problem must await further investigation, but a certain amount of evidence is now available that the production of immune strains, at least on a laboratory scale, is not impossible. The conclusions of Webster, who worked at the Rockefeller Institute on mouse typhoid, are worthy of repetition. He says, "that in mice, host resistance contains important hereditary factors, both specific and non-specific in nature, and that the degree of this resistance in a given population may be enhanced by selective breeding."

Let us now consider poultry hygiene and management in relation to disease. Amongst the more important questions on which farmers are sharply divided is the size of the flock. At last year's conference one speaker is reported to have said:—

"I see no obstacle to incubating huge masses of chicks at one time, caring for them in mammoth brooder houses, or housing the adult birds in immense laying sheds of 2,000 or more in one building. My experience has taught me to look for no deterioration either in stamina or egg-laying capacity. I have never had any serious diseases or undue difficulty in rearing large units of chicks."

The same speaker is reported to have said later that he experienced losses of fifteen to twenty per cent. amongst his chicks which he attributed mostly to feeding, but that chicks naturally reared were not so susceptible. There, then, we have the penalty of mass production, and the acceptance of a twenty per cent. mortality as not indicating serious disease or undue difficulty in rearing. But the losses do indicate serious disease and undue difficulty in rearing and, further, are attributable to keeping the chicks in large units. Greater losses are being tolerated daily on many farms in this country, and still the obvious and proven remedy of reducing the size of the unit is not adopted.

I realise that the large unit, whether of chicks or adults, saves labour, but I am informed by many poultry keepers whose opinion is entitled to respect that they never obtain as many eggs or as good chicks in the large as compared with the small flocks. In addition, there is the risk of contagious disease, which, other things being equal, is directly proportional to the size of the unit. I shall not labour a point which is known to you all.

Housing is of importance, especially as regards the necessity for simple, removable fittings, and for reserve accommodation, particularly in laying tests. Many think that a house should keep the birds warm, but its only purpose should be to protect them against extremes of weather ; egg production will not suffer if the birds are properly fed. Efficient ventilation without draughts, dryness, and abundant sunlight are necessary. We are only now beginning to realise the disinfectant value of sunlight, and the favourable influence it has on animals, especially on the young. Overcrowding is to be avoided, especially amongst chicks. Beginners should note that brooders on the market, say of one hundred chick size, are intended for that number of day-old chicks.

All plant should receive thorough routine cleaning and disinfection at least twice yearly, and at such other times as are necessary to maintain cleanliness. I shall not discuss the methods here, but ask you to note that disinfection without thorough preliminary cleaning is of little value, and that the use of a force spray pump is an advantage. Daily cleaning of the dropping boards is essential, care being taken that no dung is allowed to accumulate. The practice of collecting droppings in pits at the back of the houses cannot be too much condemned ; it is a method which favours the dissemination of disease. Frequent renewal of the litter is important, for the reason that it receives a large amount of excreta, and consequently disease germs, which no amount of raking will remove. The need for frequent renewal is increased when contagious disease is present, and in the open type of house, in which the litter may get very damp, a circumstance which favours the life of animal and vegetable parasite.

The almost universal practice of feeding grain in the scratching litter is unsound from the sanitary point of view—the fowl is the only animal which is asked to consume its food mixed with excreta, but it seems to be the only method by which birds can be exercised in bad weather. The risks attached to the method can be diminished by frequent renewal of the litter. During outbreaks of disease the grain should be fed in troughs.

I have referred before to a carefully-balanced ration, or, in other words, a ration which will satisfy all the needs of a fowl, whether for eggs or meat production, with an economy of working of its nutrition organisation. We do not yet know what the balance is, but when it is discovered we shall have made the most important advance in our fight against disease. I think that the initial defensive mechanism against disease is largely a matter of nutrition, and that faulty feeding, and the functioning of organs in excess of possible nutrition are the most important predisposing causes of disease. We have, in addition, diseases caused directly by food deficiency, such as rickets, where, to the best of our knowledge, no disease germs intervene.

While discussing feeding, I have to revive the old controversy regarding dry and wet mash. I am not here concerned so much with food values, though I believe the latter is more favourable to high egg production, if that is desired, but I wish to emphasise the danger of disease associated with the common method of dry mash feeding. The larger the unit the greater is the risk of having food continually before the birds. The danger of a system whereby a sick bird can distribute disease germs by excreta or discharges into a hopper or trough from which other birds feed is too obvious to require elaboration. The diminished losses following the removal of dry mash containers during outbreaks of disease have been, in my experience, very striking.

The nature and extent of land for birds deserves attention. Well-drained land of sufficient area to prevent overcrowding and to provide alternative runs is essential. While penning birds favours a concentration of infection, the free range system cannot be regarded as a practical proposition in most districts.

In any system of farming birds of different ages should be kept apart, not only from the point of view of food supply, but also because adult birds are frequent carriers of disease parasites which may have little effect on themselves, but may cause serious disease in young birds. The most important example of this is found in turkey farming, where blackhead is the predominating cause of loss. The adults commonly suffer from a chronic form of the disease and can infect the chicks, usually with fatal results. Blackhead can be easily eradicated by hatching and rearing with ordinary hens, or, less easily, but equally efficiently as regards the disease, by artificial methods.

The separation of different species of birds is also of importance. The necessity for this is specially apparent where turkeys are kept. Adult turkeys are commonly infested with gape worms, from which they suffer no inconvenience, but which can easily infest ordinary chicks with results so well known to us all.

The early recognition and the immediate isolation or destruction of sick birds and carcases are necessary preventive measures.

Birds received from shows, laying tests, or other farms should be isolated for at least a month after arrival, and should be introduced to the general flock only if found to be healthy after continued observation and careful examination. I think it would be well if competitors in shows and laying tests were required to isolate their birds for a similar period before dispatch, and to furnish a certificate that such isolation had been carried out, and that the birds were apparently free from disease, the certifier as to health being preferably a veterinary surgeon. The suggestion might be difficult to carry into practice, but it would do much to avoid the exhibition of diseased birds at shows, where the examination is necessarily imperfect, and to prevent the serious outbreaks of roup which have marred our tests of recent years.

I have suggested the employment of a veterinary surgeon, and I think the time has now come when, if the industry is to progress, he must take his rightful place in the fight against disease. In the past you have been too reticent and have preferred to suffer diseases on your farms, to your own loss, and frequently to the loss of those who buy from you. In the past you have been too easily satisfied with lay opinion, both as regards diagnosis and preventive treatment. I do not think I can emphasise too much the fact that the diagnosis of the majority of poultry diseases depends on highly technical methods, and that methods such as are applied to diseases of man and other animals are required and deserved. It may be that small poultry farmers are unable to pay a veterinary surgeon's fee, but there is no reason why local associations should not employ a veterinary adviser, as is done on the Continent. I can assure you that the Veterinary Profession is willing to co-operate in that direction.

Finally, let us regard the prevention of disease not only as a financial necessity, but also as a moral duty. We deplore extravagance in our social system; let us equally deplore the present extravagance in the lives we have caused to be brought into being.

Systematic Feeding of Cows in Wiltshire.

By E. H. Bruce Davis and G. Ernest Hughes.

(Reprinted from the Journal of the Ministry of Agriculture and Fisheries.)

The following article is based on the writers' joint experiences of the feeding of dairy cows according to the system advocated by the County Agricultural Organiser for Wilts.

They were the first two farmers in the county to put into practice the advice given by the Organiser in respect of feeding, and the purpose of the article is to give first hand their experience of the results.

The writers got into touch with the Agricultural Organiser owing to attending a course of lectures commenced at Warminster in November, 1922, and they were so impressed by the lecturer's remarks that he was asked to supervise personally the feeding and management of their milch cows.

Basis of the System.—The Organiser laid it down in his lectures that—

(1) Cows should not go up in milk on going out to grass.

(2) Heavy milking cows should not lose flesh.

(3) Cake and meal ought not to exceed 3½d. per gallon at the then current prices.

(4) A maintenance ration equivalent to 20 lb. hay should be given (*i.e.*, 0·8 lb. digestible protein and 6 lb. starch equivalent).

(5) A production ration should be fed for each gallon of milk the cow is giving (standard 0·56 lb. digestible protein and 2·25 lb. starch equivalent).

(6) The total dry matter to be 27-33 lb.

(7) The cow should be prepared for her lactation period before calving (equivalent to two gallon ration).

(8) Strict attention should be paid to milking and daily recording as far as practicable.

(9) Concentrated food should be used in the maintenance ration for reduction of bulk in the case of heavy milkers.

(10) Roots should be dispensed with where they have to be bought. In any case not more than 50 lb. per day should be fed, and 30 lb. for preference.

(11) Chaff should be replaced by long straw.

The writers' farms differ in character, Farm A being a mixed farm on the greensand, one-third arable and two-thirds grass, and Farm B a totally grass farm on clay, adjoining the chalk. In both cases the grass is of good average quality.

Before commencing on this system, both herds had been recorded and attempts had been made to feed in accordance with yield. Both herds are non-pedigree Shorthorns, with a few Friesian-Shorthorn Cross heifers on Farm B.

As the cows had previously gone up considerably on going out to grass, and the heavy milking cows had always lost flesh, it was felt that the system hitherto followed had not been correct. As far as cake and meal were concerned, the cost had, in the past, been somewhere in the neighbourhood of 5d. per gallon, so that if the cost could be reduced to 3½d., there would be an immediate saving of 1½d. per gallon, even if no increased yield was obtained. In consideration of the above, the writers decided to give the system a trial.

Rationing System.—The system of feeding then adopted on the two farms was:—

Farm A.	*Farm B.*
Hay 16 lb.	Hay 20 lb.
Straw (long) 5 lb.	
Roots 30 lb.	

and, in each case, a production ration per gallon. In the case of heavy milking cows, the bulk of the maintenance ration was cut down by replacing part of the hay by half its quantity of a mixture of bran and oats, and roots were cut down in the case of Farm A to 14 lb.

Farm B, prior to this, was purchasing roots at 25s. per ton and hauling four miles, feeding 25 lb. per day, but these were discontinued at once; also a certain amount of hay was chaffed, and this was discontinued.

Farm A had also been feeding chaffed straw mixed with the roots, but discontinued the chaff and fed the straw long.

The production ration consisted of the following :—

Farm A.

Decorticated cotton cake ...	1 part	feeding 3½ lb. per gallon.
Rice meal and oats	2 parts	
Unextracted palm kernel cake	2 parts	

Farm B.

Decorticated cotton	½ part	feeding 3½ lb. per gallon.
Decorticated ground nut ...	½ part	
Rice meal	2 parts	
Unextracted palm kernel cake	6 parts	

also 3½ lb. soaked coconut cake in the form of thick porridge was fed for the first gallon in the case of Farm B.

The writers consider it preferable that half of the production ration should be in the form of cake and of large pieces for preference. The reason why these particular foods were used was that they were the cheapest at the time. Heavy milking cows for every gallon over five and heifers for every gallon over four were fed with 2 lb. linseed and ¾ lb. bran per gallon.

Results.—As an immediate result, all cows increased their yields and maintained them more evenly throughout the winter; all the cows kept evenly fleshed, and at the end of the winter cows never went out to grass looking better. Probably one of the most important factors was the preparation of the cow for her lactation period. This was done by feeding a laxative production ration for six weeks before calving, commencing with a one gallon ration at the six weeks and increasing to a two gallon ration at the month. This resulted in the whole of the cows coming down at calving at least a gallon higher than at any other previous period, so much so, that if a cow comes in under five gallons it is an exception.

For this ration when cattle are out to grass and also when the hay on the farm is laxative palm kernel is used. Indoors, when the hay is not particularly laxative, two parts linseed cake and one part rice meal are given.

Milk fever is not feared, as precautions are taken before the animals are calved, and on neither farm has there been a case of milk fever.

At the commencement of the system, daily recording was practised to see the effect of the rations on the individual cows, and to increase the food to those increasing in yield. This also enabled the writers to keep a check on their milkers.

On going out to grass, Farm A had a slightly increased milk yield—about seven per cent.—but Farm B had a decreased yield of about six per cent., part of which was later recovered. In both cases cows were turned out to plenty of grass about the beginning of May.

At the end of the year, Farm A had an increased average of fifty gallons per cow and Farm B of 120 gallons per cow ; in the former case the herd had been recorded for many years, whereas the latter was newly formed, and had only been recorded for three years. On Farm A it is estimated that the decrease on the cake and meal bill, after making an allowance for difference in prices, was over £150 during the year.

Modification and Results in the Second Year.—After the experience of 1922-23, the writers were absolutely convinced of the effectiveness of the system, and preparations were made for the following winter by forward buying of feeding stuffs in collaboration with the Organiser. During the last winter more attention has been paid to dry matter by the cutting down of bulk of the maintenance ration, and in all cases the cows have been prepared for their lactations, this latter point being one that is most important. This preliminary feeding before calving is even more necessary for heifers than for cows, as is proved by the heifers in these two herds.

Also in the case of Farm A roots have been reduced to 14 lb. per day, although there were sufficient on the farm to have fed 70 lb. per day.

With one winter's experience behind them and the men being more accustomed to the work, and at last being converted, the results have been even better than the previous winter—to be precise, the daily average has been increased half gallon per cow.

On Farm A the average number of cows (including dry cows and seventeen heifers) was seventy-five, and the average daily yield during the winter was 200 gallons. On Farm B, the average number of cows (including dry cows and nineteen heifers) was sixty ; the average daily yield during the winter, 170 gallons. The ration for the last winter, owing to forward buying, cost 3d. per gallon. At the present moment (at the end of seven months) there are in Herd B as many 1,000-gallon cows as there were in the preceding twelve months.

Experiments have been conducted on three times milking on part of the herds, the result being half gallon increase per cow and 75 per cent. of cows responding. The effect was most marked on the heifers, some of which increased up to one gallon per day.

At the time of writing Herd A has gone out to grass, and at the end of three weeks the yield is down five gallons per day. Herd B has only been out to grass three days, and the three times milked cows have shown a slight increase ; these latter cows are kept in from 1 p.m. to 8-30 p.m., and have their cake ration for gallons over three during that period.

The system of summer feeding is :—a value is put to the grass (at present, 20th May, three gallons) and a balanced production ration fed for each gallon over three. The feeding value attached to the grass is altered as the season advances. A small quantity of cotton cake is fed to prevent cows being too laxative. In the fall of the year the grass will be balanced up to three gallons by a concentrated cake.

From the writers' experience of this system of feeding, they are absolutely convinced of the efficiency of the system, and are very grateful to the Organiser for his advice. They are certain that every dairy farmer will be well repaid for any attempt he may make to follow the system.

The writers would like to emphasise the fact that from their experience it is not a question solely of feeding a balanced ration according to yield, but it is by attention to minor details of management that the

best results are obtained. As far as their experience is concerned, they are convinced that the feeding of chaff is detrimental, the heavy feeding of roots is not economical or desirable, and the order of feeding the various fodders and concentrates is of material importance. The importance of the order of feeding is to prevent, as far as possible, the animal overfilling herself, as one of the essential factors in the Organiser's instructions is that the cow must not be overfilled. To get over this, the cake and meal is always fed before the bulky food, as, if this is done in the opposite order, the cow, being hungry, will eat a large bulk of hay, and then consume cake and meal afterwards because she likes it, resulting in overfilling and a grunting cow; also, for heavy milking cows, three times a day feeding of concentrates is practised. The order, then, is as follows :—

5-30 a.m., one-third cake and meal.
7 a.m., hay.
1 o'clock, one-third cake and meal, followed by hay.
6 p.m., one-third cake and meal followed by hay.
Watering three times a day, the last watering being at 8 o'clock at night.

The value of watering at 8 o'clock at night cannot be over-estimated.

Although the writers were the first farmers in Wiltshire to commence this system, it is common knowledge that a large number of farmers are now doing the same with similar beneficial results, and in some cases with even better results than their own.

The Antirachitic Action of Milk.

The protection of children from rickets is a sociological problem of great importance. We know that exposure to sunlight is an excellent prophylactic measure, but unfortunately sunlight is rarely available in an English town in winter, since the beams that struggle through the clouds are effectively cut off by the smoke pall that disgraces all our large towns. It is therefore very necessary to feed infants on a diet containing an adequate amount of the antirachitic factor, and hence the antirachitic value of milk is a question of the greatest interest. The relative importance in the causation of rickets of light deficiency, and of a diet deficient in vitamins has been a subject of controversy for several years, but some interesting facts have been brought to light by an investigation recently conducted by Miss Ethel M. Luce at the Lister Institute.* A single cow was kept under varying conditions for more than a year, and the growth-promoting and antirachitic actions of her milk upon young rats was tested every month. When the cow was on dry fodder in a dark stall (six months) the growth-promoting and antirachitic properties of the milk were poor; when the cow was on fresh green fodder in a dark stall (two months) the growth-promoting effect was good, but the antirachitic effect poor. On pasture (three months) both were good; on dry fodder out of doors (two months) the growth-promoting properties were poor and the antirachitic moderate. The "good" milk had about four times the activity of the "poor" milk. These observations appear to indicate that the growth-promoting or vitamin-A factor in milk is not identical with the antirachitic factor, and, further, that the two factors can vary independently. There is a considerable amount of collateral evidence for these conclusions. It would seem that the amount of growth-promoting factor in cow's milk depends mainly, if not entirely, on the diet, whilst the amount of antirachitic factor is determined partly by the diet and partly by the amount of light to which the cow is exposed. These conclusions are of considerable practical importance, for they lend strong support to the view that the milk of pasture-fed cows is greatly superior to that of animals fed on dry fodder. This superiority is equally evident in the growth-promoting and the antirachitic properties of the milk, for when cows are stall fed on green fodder their milk is satisfactory as regards growth-promoting qualities, but not as regards antirachitic properties. We find in this experiment support, also, for the belief that during the winter months there is a danger of infants developing rickets even when they are receiving large quantities of cow's milk. This is a view that Hess has long maintained. The liability to rickets is, of course, lessened by exposure to sunlight or to ultra-violet light, but these are not always available. Fortunately all available evidence agrees in showing that cod-liver oil contains a relatively enormous amount of the antirachitic factor, and the prophylactic use of this oil appears to be the means most generally available for the prevention of rickets. —*British Medical Journal.*

* *Biochem. Journ.*, 1924, xviii. p. 716.

The Veterinary Surgeon in Fiction.

By E. Patrick, M.R.C.V.S., Stow.

Being somewhat amused by reading the essays on the ideal veterinary surgeon, I will give an illustration of the difference between the ideal and the real in a remote country practice—present day.

Time, 1 a.m., aroused by dog barking, I put my head out of the window into black darkness, pouring rain, thunder and lightning.

Voice from the darkness: "Be yew the farrier"? Not being prepared to enter an argument as to what or what is not a farrier, I answer in the affirmative. "Maister hev a oss colicked, been bad all day, given him a pint o' linseed oil, five bottles gaseous fluid, half a bottle o' Suddington's oils, and a pint of chamberley, an 'e aint no better, and maister sez you ev to come at once." (Farm 8 miles off.) Finding it always the best policy to keep on smiling, I ask the messenger to step under shelter, while I hastily dress, slip down, light the lamps, harness the pony, and collect the few requisites.

By this time, for my special benefit, no doubt, the storm abates, but the darkness continues.

The journey, after the opening of several awkwardly fitting gates, single-handed, being done, I find a big

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THE R.A.V.C. (TERRITORIAL ARMY).

During the last two months the Territorial Army has undergone its annual training and much has been written in the daily press on the exercises carried out, and the efficiency or otherwise of certain Divisions and on the army as a whole. The R.A.V.C. (T.A.) has been allotted its meed of praise, and we may say deservedly so. Directly after the war every Territorial Division was allocated a veterinary hospital, an evacuation section and a mobile section, with a veterinary headquarters comprising a D.A.D.V.S. (a territorial officer) and the executive veterinary officers attached for duty to brigades of artillery or yeomanry regiments, and certain N.C.O.'s and men.

With the advent of the wave of economy the R.A.V.C. (T.A.) was one of the first units to be cut down until now, with the exception of two Divisions, the R.A.V.C. personnel of an infantry division consists of one mobile veterinary section, composed of one officer, one sergeant, one corporal and eight other ranks, and a veterinary headquarters, comprising the D.A.D.V.S., four sergeants, one private and one executive veterinary officer for every brigade of artillery.

The sergeants R.A.V.C., on headquarters, are for attachment to three infantry brigades and divisional headquarters respectively, their duties being to act as dressers, etc., and they must have a knowledge of the use of the contents of the veterinary chests supplied for their use.

It is gratifying to know that nearly all the divisions are up to full strength as regards R.A.V.C. officers and men, and the majority of the personnel is of the right stamp for the work. There are, however, vacancies for officers, and as time goes on more will occur owing to resignations and compulsory retirements enforced by the age limit, and there should be plenty of aspirants for commissions in the Territorial Army among the newly-qualified veterinary surgeons. It is true that more is expected of the territorial officer than was the case in the old days, but this extra requirement is all for increased efficiency, which should be the aim of all ranks. The work expected of the T.A. veterinary officer during annual training is not, to an energetic man, at all heavy, and he is practically certain to find himself among an intelligent and genial class of man in his fellow officers. The outdoor life, riding, regular time table, etc., acts as a wonderful tonic to the man who has been hard at it in a town or country practice. There is also established a Territorial Reserve which veterinary surgeons may join should they not feel inclined to perform all the duties expected of those joining the T.A., or to which officers who have served in the T.A. may retire. A new supplemental Reserve of other ranks is now in process of formation, full particulars of which may be obtained from the War Office.

We would appeal, therefore, to our members to keep up the splendid patriotic spirit they evinced during the war, and at once come forward to fill any vacancies that may exist in the divisional area in which they live. The D.A.D.V.S. of the division would, we are sure, be only too pleased to give particulars of pay, service, etc., but should a member not know how or where to approach this official, a line to the office of the D.G., A.V.S., War Office, will doubtless produce the information required.

(*Continued from previous page.*)

cart gelding in acute abdominal pain with not enough bowel action. Give B. cath. ℥viii. and put into comatose condition by a maximum dose chloral. Horse now standing still as the plaster of Paris horse in my surgery window, and fortunately it went on all right.

Another instance.—Messenger arrives about midnight to say: Mr. ——— of ——— has a cow which has been *trying to calve all day*. They have had Mr. So-and-so's foreman and Mr. So-and-so's shepherd, and they have given up the job as a hopeless case. The usual message is, of course, you have to come at once. On arrival, I find a simple case of breech presentation, which is summarily dispensed with without any difficulty whatever.

This goes to show that the present day client sends for one only when his own efforts are a failure.

In our advertisement columns attention is drawn to the Autumn Term courses of lectures and demonstrations to be held under the auspices of the Royal Sanitary Institute. The course for meat and food inspectors commences on Friday, October 3rd. The lectures are followed by the standard examinations of the Institute, which are recognised in all parts of the British Empire.

CLINICAL AND CASE REPORTS.

Verminous Hepatitis in a Mule.

By Capt. D. A. Gillmor, R.A.V.C.

A small mule, 12 years old, 13.2 hands, of the Lewis gun type, was first seen in the unit lines in April, 1924. He was in poor condition, although otherwise apparently normal. Arrangements were made to feed him with two other mules on a more liberal diet. The three were picketed by themselves a short distance from the lines, and sent only to light exercise. The mule in question appeared rather to go back in condition, and was admitted to the Station Veterinary Hospital, Lucknow, on the 9th of June.

Treatment.—As the condition was considered due to worm infection, a course of arsenic was administered, followed by purgatives and tonics. Stomach lavage was attempted, but was not successful. The latter treatment did not receive a fair trial, as an enema pump was the only one available, and attempts to join it with the stomach tube were very unsatisfactory. During treatment the appetite remained good; temperature, pulse, and respirations were normal; the mucous membranes were slightly anæmic, but never icteric. No real improvement was shown at any time. On the 28th July, death occurred from internal hæmorrhage.

Post-mortem Examination.—The peritoneal cavity was full of blood due to rupture of the hepatic vessels. All the abdominal organs were normal, except the stomach and liver. In the stomach wall two tumours were found, each about the size of a pigeon's egg, apparently due to *Habronema megastoma*. One of these was discharging a greyish-yellow pus into the lumen.

The liver was very much enlarged, and indurated throughout the whole of its substance. Innumerable small greyish areas were visible scattered through the liver tissue, which was much lighter in colour than normal. The organ on removal weighed 38lbs.

The following report was received from the Director, Imperial Bacteriological Laboratory, Muktesar, to whom a piece of the diseased liver was forwarded:—

Histological Examination. — Intense verminous hepatitis; innumerable inflammatory foci scattered throughout the liver tissue, mainly in an inter-lobular situation, the typical structure of each of which is:—

(*a*) Centrally, a necrotic degenerating mass of variable size (the remains of the dead worm).

(*b*) A wall of young connective tissue of variable thickness.

(*c*) An outer zone of small-celled infiltration, the figured elements in which comprising, for the most part in some areas, Eosinophile leucocytes.

No bacterial micro-organisms were seen in the liver tissue.

Remarks by Chief Bacteriologist.—This condition is set up in intense fluke invasion of the liver in other animals, notably the sheep, but I am not acquainted with the condition in the horse. It is not unlikely the invasion was a migration of Habronema worms from the tumours in the stomach wall.

An Equine Tobacco-chewer.

By Lt.-Col. J. W. Rainey, London.

A Belgian horse, a gelding about seven years old, the property of an undertaker in Bow, London, E., is a confirmed chewer of tobacco. The attendant who has had sole charge of the horse for some years, and has made a great pet of the animal, states that he first observed the fondness for tobacco about three years ago when the horse, in play, took from his (the attendant's) mouth an unlighted cigarette end, masticated it and swallowed it.

When one has occasion to go near this horse he continuously searches one's clothes and hands with his mobile lips in the hope of finding or being offered tobacco. He does not care for machine-made cigarettes; his desire is solely for shag, loose or rolled into a cigarette.

It has been necessary to warn the stablemen not to indulge the horse too freely, because, on occasions, he has been given as much as half an ounce of shag tobacco, without satisfying his craving, and it might happen that some generous and inquisitive person would try to discover how much tobacco the horse would eat.

[Tobacco eating is a common trait in goats, which seem to suffer no ill-effects.—Ed.]

The Infliction of Pain.

By R. E. Alexander, M.R.C.V.S., Liverpool.

The first operation at which I assisted as a student was a minor one, in which a dog was castrated. No anæsthetic was used, and the howling of the dog made me feel sick. The other "green" students with me were similarly affected, but as time went on they grew more accustomed to the performance of minor operations without anæsthesia, such as castrations, docking dogs' tails, etc. But I there and then registered a vow that I would never inflict needless pain for the sake of a little trouble. It is a psychological fact that the mind grows hardened to anything, and this is quite true with regard to the infliction of pain.

I do not refer to cases where the infliction of pain cannot be avoided, as frequently happens in country practice. There are problems, of course, such as the standing castration of horses. Here we inflict pain with a twitch to mask the pain of operation. In the case of cattle economic conditions are a hindrance. Nevertheless, we ought to do what we can. With regard to castration in horses, Captain E. Brayley Reynolds, O.B.E., M.R.C.V.S., says:—

"A general anæsthetic should be given when the operation is performed in the recumbent position in all

but the young unbroken animal. If the operator holds the view that the latter should not be castrated except under the influence of an anæsthetic, to be consistent in his humanitarian principles, let him become proficient in administering an anæsthetic to the standing animal. This, in the writer's opinion, is the only justifiable method of administering chloroform for performing the operation of castration upon young animals. If the animal is cast before administering the anæsthetic, then he will be conscious of much more than half of the total shock and fear that he undergoes, and the advantage of the anæsthetic as a means of restraint will be lost."

He also says:—"The advisability of, and the necessity for, adminstering a general anæsthetic before castrating any member of the equine species, no matter of what age, are questions over which there have been, and for a certainty will be, many discussions."

Further discussion of this topic is useless. There always will be occasions when it is unadvisable to use an anæsthetic, owing to extreme inconvenience, weakness of the animal, youth and other reasons. But, as Mr. Scott, F.R.C.V.S., remarks:—"From a humanitarian and also from an economic point of view it is the first duty of the practitioner to overcome, as far as possible, animal suffering." He more particularly refers to diseases, but surely it applies to surgery also. On occasions like firing, docking and other minor but painful operations, cocaine can be usefully employed.

The castration of cats is generally done in a rough-and-ready way. Now that we depend more on canine and feline practice, surely we can do it more neatly and scientifically. Inverting a cat into an old boot, or wrapping it in a shawl, is not an elegant method of technique, apart from the pain caused. And there is pain, even though it only lasts a few seconds. My own procedure is to place the cat or dog in a chloroform box, into which it can be induced as a rule without any unseemly scuffling. One can see through the glass window when the animal is just under. It is lifted on to the table and operated upon, and generally comes round a few minutes afterwards. Owners as a rule are willing to pay a little more for this method, and the operator is protected from the claws of the animal, which can be formidable at times. Cats are very squirmy creatures, and the spectacle of a hot-tempered and choleric veterinarian pursuing such an animal round the surgery can be very humorous. Personally, I prefer to avoid it.

It is known now that pain is more superficial than was formerly thought, and that the deeper tissues are less sensitive. As veterinary surgeons, we are condemned to inflict pain very often for the sake of public convenience, but now we possess such agents as chloretone, procaine and other drugs, a great deal of suffering can be avoided. Without sloppy sentimentality one can be considerate, and thus maintain the honour of the Veterinary Profession.

ABSTRACTS.

A Note on the Dog's Tapetum in Early Life.*

By C. H. Usher, M.B.,B.C.(Camb.), F.R.C.V.S.(Edin.), Aberdeen.

Abridged from The British Journal of Ophthalmology, August, 1924.)

This note is written for the purpose of pointing out that the tapetum of the dog is not recognizable ophthalmoscopically for several weeks after birth, and that the early ophthalmoscopic appearances of the tapetum differ markedly from those seen in the adult animal.

A considerable search through ophthalmological and veterinary literature and conversation with some ophthalmologists, zoologists, and veterinary workers, has convinced me that these points are at least not generally known, though it seems unlikely that there is no record of them somewhere in literature.

The present observations were made on the eyes of puppies from ten different litters. In some cases only a single examination was made, in others an examination was made every week.

As regards the length of time that elapses, from the date of birth, before the tapetum begins to assume its brilliant coloration an ophthalmoscopic examination of the eyes of 17 puppies in the fifth week showed no evidence of a tapetum, and in eight puppies examined before the fifth week no tapetum could be seen. For the purpose of determining when the tapetum first becomes recognizable only four of the observations are available, namely, 2, 8, 9, and 10. In observation 2, signs of the tapetum were seen on the 49th day. These were not present five days earlier. In observation 9, the first signs were seen on the 50th day. These were not present one week earlier. In observation 10, the first signs were seen on the 47th day. These signs were not present one week earlier. In these three litters then, the colouring of the tapetum in the seven puppies' eyes was visible for the first time from the 47th day to the 50th day, and in two of these litters (observations 2 and 9) it certainly was not present before the seventh week, and in the third litter (observation 10) before the 40th day. The onset of the coloration in (observation 8) the bulldog puppies, occurred earlier, namely, at the beginning of the sixth week, for three of the four puppies showed a faint green in the tapetal region on the 36th day. No coloration had been observed one week earlier. The early colouring was different in this litter from that in other litters, but it is possible that purple had appeared and had been replaced by

* Throughout this paper "tapetum" refers to the tapetum lucidum.

green, within a week, during which time no examination was made.

The earliest colour to appear in the tapetum, as seen from these observations, is a beautiful purple which before long is gradually replaced by a brilliant pale green in which, later, spots of yellow develop. The margin of the tapetum remains purple. It may be that the above sequence of colours varies to some extent in different breeds as the litter of bulldog puppies suggests, in which the first colour seen was pale green.

A short account of what obtains in the case of the cats' tapetum is here added. In 1871, Schultze[1] recorded absence of metallic lustre in the choroid of the cat two weeks after birth. In 1884, Hilbert[2] examined a kitten's fundus ophthalmoscopically at frequent intervals. His description appears to be the only account of the early ophthalmoscopic appearances of the tapetum in the cat, and is founded on the examination of a single kitten. He found that a yellow coloration preceded the subsequent blue and violet.

The tapetum of the cat resembles that of the dog in that there is no ophthalmoscopic evidence of its presence during the first few weeks of life, and in that the green colour of the tapetum of the adult cat is preceded by a diffuse purple coloration of the whole of the tapetum. These remarks are based on the examination of kittens from four litters.

In comparing these results with what was found in the puppies, it would appear that generally the colour of the tapetum is later in appearing in the dog than in the cat. In three of the cat litters purple was observed from the 29th day to the 32nd day, in the remaining litter there was no coloration on the 36th day, whereas in the dog the earliest appearance of colour was on the 36th day, namely, one week later than the earliest occurrence in kittens, and the more usual date in the dog was from the 47th to the 50th day, that is, more than two weeks later than in the kittens. Without exception, purple was the first distinctive tapetal colour to appear in the kitten.

REFERENCES.

[1] Schultze, M.—"Ueber das Tapetum in der Chorioides der Raubthiere." *Sitzungsberichte der Niederrheinischen Gesellsch. f. Natur und Heilkunde, Nachtrag zum Bericht über der Sitzung*, von November 27th, 1871. Original not seen. *Ref. Nagel's Jahresbericht*, p. 45, 1871.

[2] Hilbert, Richard.—"Ueber die nach der Geburt eintretenden entwickelungsgeschichtlichen Veränderungen der brechenden Medien und des Augenhintergrundes der Katze." *Arch. f. Ophthal.* Vol. XXX., No. 3, p. 245, 1884.

The report of the Commission on the Cost of the Public Service of Southern Rhodesia takes a very friendly view of the work of the Department of Agriculture, and recommends no radical reductions in its activities. On the other hand, dealing with the Veterinary Department, it recommends that the staff of veterinary surgeons (including the C.V.S.) should be reduced from twelve to seven.

DIVISIONAL REPORT.

Derbyshire Division.

(*Continued from page* 748).

Mr. HEATHER said a lot of discussion on the unqualified assistant had been rendered impossible in Derbyshire, as a bye-law of the College prevented them from discussing unprofessional conduct. There had always been unprofessional conduct to a degree in every association, and the members could only bring it forward by writing direct to the Registration Committee. He would like to have defined the degree to which the Association could safely proceed in discussing unprofessional conduct. Since the Derbyshire Association had been formed, some very interesting points had been brought up and resolutions passed, but because they touched certain members they had been rescinded. He was very much interested in the question of veterinary surgeons acting in an honorary capacity at shows where patent medicines and veterinary instruments were sold. He thought that it was a question the Royal College should take up and support, because he did not know a greater opponent to the profession than the "quack." A veterinary surgeon was called out by night to attend a case, and found the owner of the animal had used without result thirty shillings worth of patent medicine he had paid for beforehand, and the veterinary surgeon put the animal right, charged fifteen shillings, and had to wait very often for the money. He had to thank the Derbyshire Association for many things. If he went away for a day, all he had to do was to write or ring up a fellow member, who would look after his practice efficiently. In former days a man came, gave a lift, and sneaked all the clients. (Laughter.)

Mr. ASTON expressed his agreement with Mr. Livesey on not joining an association for what could be got out of it. Personally, he had got a great deal out of the "National" and local associations to which he belonged, and he knew of no better holiday than to go to the "National" meetings. Referring to the remarks of Mr. Howe, he said that in his opinion they would never get public appreciation of their services unless they rendered something more than their common due to the public, and he asked how many veterinary surgeons took any active interest in the civic life of the town in which they lived. Dealing with the question of covering, he said when a veterinary surgeon sent an unqualified man to do some of his work he was lowering himself and his standard of work. Covering was a very bad thing, but every man must be left to his own moral welfare so far as responsibility went. He had been told by older veterinary surgeons that he was no good in practice, as he did not sell sufficient medicines. His answer was that he gave advice, and he expected his clients to pay for it. It appeared absolute Bolshevism to push down the public throat the doctrine that they must not use patent medicines. Veterinary surgeons must quietly

educate the public out of it, and they would thereby do more good than by passing all the resolutions in the world.

The PRESIDENT stated that until that afternoon he had no idea so much work was being done by the "National," though he had known that a good number of men had given of their time and services to it for a great number of years. It appeared that a good many practitioners grumbled at what was done, out of sheer ignorance that anything had been done. He could not understand how anyone in this age could employ an unqualified assistant. It was the members of the profession who made those assistants. He thought it very lowering indeed, in view of what the public thought, to employ such assistants. Certainly they would never raise the profession to the level of the medical profession in that way, and he thought it was for the Royal College to see that the abuse was stopped.

Mr. LIVESEY said Mr. Levie had asked if it was possible for the Royal College to prohibit the unqualified assistant. There was a bye-law in the College which laid it down that it was unprofessional conduct on the part of a veterinary surgeon to allow his name to be used by an unregistered person, to meet an unqualified person in consultation, or to give a testimonial for proprietary medicines or appliances. It was impossible to believe that if a veterinary surgeon had an unqualified man as his assistant he could carry on his practice without meeting that unqualified man in consultation. Such conduct if reported by an individual should result in the veterinary surgeon being called before the Registration Committee. Speaking of other points raised, Mr. Livesey said there was no law to prevent any man practising as a veterinary surgeon. Everybody was entitled to attempt to cure illness in human beings. So long as he did not represent himself to be a doctor, he was not breaking the law. Any man had a right to treat animals if he wished to, and he could not be prevented so long as he did not use the title or pass himself off as a qualified veterinary surgeon. He reminded the members of the Association that, if they would only stop their own members from engaging unqualified men, they would be stopping the supply of such men, and he appealed to them to give preference to the graduates of the Colleges. There was every reason why students should go out and see practice—in fact it was only by taking students out with them to their cases that they would be able to get practical new veterinary graduates. The attitude of the medical profession to the veterinary profession was rapidly improving. Doctors were getting to know them better, and the benefit that had come to both professions by meeting together as at such institutions as the Royal Society of Medicine was of astonishing value. He thought one way of getting over difficulties with local authorities would come with the appointment of a permanent veterinary staff to the Ministry of Health. The present Government were not unfavourable, and he thought it would come in time, and might eventually lead to a Veterinary Department of State. With regard to the drug circular, he did not think there was one recipient in ten who did not put it straight into the waste paper basket. If they looked at it from a financial point of view, it did not appear very attractive. The question of shows was a most difficult one. How could they dictate to a committee of an agricultural show as to the letting of stalls? The only thing was to show disapproval as far as possible, but it was no use for them to knock their heads up against a wall. Had not a trader the right to sell any instrument he liked to the public? He was a tradesman, and not a member of a profession, and they could not presume to restrict trade. They said they looked to the "National" to do this or that. Let them remember that the "National" only could be fully effective if it were kept fully alive, supported and even urged forward by the local associations. The life and being, the spirit of the Association was in the divisions, and if they got results in the divisions, results would come also in the "National."

At the conclusion of the meeting, Mr. ASTON rose, and in a few well-chosen remarks proposed a vote of thanks to Mr. Livesey for coming from London and giving such an interesting address, which had aroused such a good discussion. The proposition was seconded by Mr. HOWE, and heartily endorsed by all present.

Mr. PRINCE, bringing forward a *post-mortem* specimen, said he had an urgent call on Saturday morning to see some calves. Of five affected, two were dead on arrival, one died next day, and one on the third day. *Post-mortem* revealed lesions very similar to those found in cows with grass sickness, but the calves were under six months old. They showed distressed breathing, the bowels were practically normal, but there was discharge from the nose. The staggering seen in older animals was absent.

Mr. ASTON said they did not get staggering in all those cases of blood infection. He had a similar case in which eighteen calves died and only one got better.

A vote of thanks to the President brought the meeting to a close, the members subsequently taking tea together before separating.

Science and Medicine.

(Reprinted from *The Times*, August 8th, 1924.)

"At Toronto last night Sir David Bruce, this year's President of the British Association for the Advancement of Science, reviewed progress in his own subject of preventive medicine. Science may be esteemed, in the sense of Plato, as self-sufficing, a pure gain to the spirit of man. It may also be appraised, in the sense of Bacon, for the comfortable material fruit it yields. At Liverpool last year Sir Ernest Rutherford described conquests of knowledge that are still Platonic, for there is no immediate hope that the atom will soon yield a new source of energy or that the transmutation of elements will quicken the payment of our American debt in gold. But his successor had a Baconian tale to tell. In the forty years since the British Association first met in Canada the application of science to preventive medicine has done much to ward off the inimical forces which harass mankind. In 1884 the genius of Pasteur had pointed a way to the isolation

and identification of the living germs of infectious diseases, and already the micro-organisms of tuberculosis, typhoid fever, Malta fever, cholera, malaria, diphtheria, and tetanus had been described. Knowledge of the cause directed the search for the remedy. Sometimes prevention and treatment have proved simple. In Malta fever, always to be associated with the name of Sir David Bruce himself, the method was merely to stop the disease at its source by banishing from diet the milk of goats which were the reservoirs of the germ. In typhoid, a mild attack of the disease induced by vaccination makes the natural resistance of the body effectual. In tetanus, the pouring in of antitoxins prepared from the blood of another animal neutralises the toxins of the invading bacilli as soon as they are formed. There are other cases, such as tuberculosis, where the soil is more easy to attack than the seed, and where the remedy is the provision of a better environment and education in physiological living.

"Bacteria are on the vegetable side of the division between animals and plants, and a new field of preventive work on infectious diseases was opened by the discovery by Laveran, another illustrious Frenchman, of the malaria parasites. These, unlike bacteria, belong to the animal kingdom; and subsequent work by Manson, Sir Ronald Ross, Sir David Bruce, and many others, has shown that the life histories, the carriers, and the modes of prevention indicate different modes of treatment and prevention. The great plagues of the tropics, malaria, amœbic dysentery, human sleeping sickness, and probably yellow fever, belong to this group; and since the discovery that the carrier is usually an insect or tick, the obvious mode of prevention is indicated, and in many cases has been successfully carried out. In a third great group of infectious diseases, such as influenza, measles, typhus, trench fever, rinderpest, and foot-and-mouth disease, research seems to show that the living cause is an organism so minute that it passes through the pores of a filter. A definite carrier may be known, as in the cases of trench fever and typhus, so making successful prevention possible; another set, of which smallpox is the typical instance, can be held in check by preventive inoculation; still others await conclusive research, present knowledge adding little to our empirically justified confidence in quarantine and isolation. Science, by the discovery of vitamins and their relation to diseases due to deficiency in diet, and by its still more marvellous revelation of the influence of the ductless glands in health and disease, has come to the aid of preventive medicine in many afflictions of mankind that are not infectious. The treatment of diabetes by insulin—a discovery that has thrown a new lustre on the University of Toronto—and of goitre by iodine are recent and dramatic examples.

"Sir David Bruce was able to show that the applications of scientific discovery to the medical art had relieved untold suffering, saved countless lives, removed some of the worst terrors from war, made possible such engineering feats as the completion of the Panama Canal, and opened up the Tropics to white men. It is an encouraging narrative of achievement and of promise, and the President of the British Association will have fulfilled the high duties of his office if his words resound through the Empire. He has reminded us that the direct loss in England and Wales from sickness and disability still amounts to at least £150,000,000 a year. Not only must there be a better-instructed application of what is known, but there must be a wider search after the unknown. The pursuit of natural knowledge must not be limited to particular investigations of specific diseases. Pasteur was a chemist, and no one could have foretold that his curious inquiry into lop-sided crystals was to lead straight to the prevention of disease. The secret of cancer may be found by some worker engaged in abstract investigation, such as that of the bio-chemistry of the cell. The living world is a continuous network, and its web is immersed in the circumambient chemical and physical environment. The Baconian fruit may ripen on any Platonic tree."

Poultry Research.

Work of the National Institute.

A correspondent to *The Times* says:—

"An extremely interesting statement about the progress of the work provided for under the National Poultry Institute scheme has been made by Mr. P. A. Francis, the Ministry of Agriculture's Poultry Commissioner. It is published in full in the current issue of the *Journal* of the Ministry to which reference may be made for the details of the programme of research entered upon at the several centres. More particular attention may, however, be directed to an apparent lack of any provision for effective co-operation between those who are engaged in scientific research at Cambridge and those responsible for the conduct of practical experiments at other centres.

"It is stated that scientific research in problems of poultry-breeding has been begun at the School of Agriculture, Cambridge, and that experiments have been arranged which are designed to throw light upon the inheritance of fecundity, 'which is regarded as the main line of investigation.' On the other hand, a Northern Committee has been formed, and experiments begun at Reaseheath to test the effects of in-breeding and out-breeding, and record the relative fecundity of the matings; to obtain evidence on the question whether there is, or is not, a linkage between external characters and fecundity; and to record any data bearing on the possibility of building up a strain of pullet breeders. There would seem to be points of possible profitable contact between the work at Cambridge and Reaseheath, but there is no mention of any method of effective correlation.

"It is recorded, further, that scientific research in problems of poultry nutrition has also been begun at Cambridge, whilst at the South-Eastern Agricultural College, Wye, a Southern Committee has started experiments in table poultry production. These experiments are designed to ascertain the amount of weight and value of weight gained by different breeds and crosses, in relation to the weight and value of food consumed; also the feeding costs, and the best and most profitable methods of feeding for market. The suitability of breeds and other matters are to be tested, but the greatest importance obviously attaches to the choice of foods and the methods of feeding. There is, however, no mention of co-operation between the scientific research worker and the practical experimentalist.

"The work already accomplished and reported upon is suggestive of the close connection of nutrition research and the economy of production, especially in the table chicken branch of the industry. It is generally well known that the professional fattener uses as his staple fattening ration a mixture of Sussex ground oats, fat, and milk, and that for this and other purposes the fine grinding of the Sussex-dressed oats has always been assumed to have a special value. But the preliminary figures so far obtained at Cambridge 'indicate that the digestibility of the fibre of oats is little affected by grinding.' Further investigation is being made, but there would seem to be a probability of the research worker being able to show how costs of production may be reduced, provided quality can be maintained, by the use of a less expensive ration."

The Price of Milk.

(Reprinted from *The Times*).

"Once more an unhappy disagreement, in which the public is closely interested, has arisen between the farmers who keep cows to produce milk for sale and the distributing agencies, represented by the National Dairymen's Federation, which deliver the milk to the consumers. The price of milk for the most part is fixed yearly by a Joint Committee of producers and distributors, and, as we announced recently, the negotiations between the two parties have broken down, the distributors having placed before the dairy farmers terms which they find themselves unable to accept. The terms which were published recently have already been commented upon by the National Farmers' Union in an official statement and in a resolution passed by the Union's Milk Committee, which was specially summoned for the purpose; but the case for the distributors has not yet been made public. Until, therefore, they declare themselves, consumers may not fully be able to appreciate the issue in all its bearings; though so far as it immediately concerns themselves the proposal of the distributors is that they shall receive their milk from the retailers at sevenpence a quart during the six winter months. Last year the price for three of the six months was eightpence. As milk is an indispensable article of food, the prospect of cheaper milk cannot but be welcome; and consumers, moreover, who remember the statement contained in the Linlithgow report of April last year on the distribution and prices of agricultural products, to the effect that an extra charge of one penny a quart lessens consumption by as much as fifteen or twenty per cent., will realise how much the diet of the community stands to be affected by the cheapening. Could the matter be left here there would be no ground, in the minds of consumers, for doubt or anxiety.

"Unfortunately, however, they can by no means be sure that the prospective supply of milk would be, at such a price, either as abundant as they could wish or as plentiful as farmers themselves could desire. The dairy farmers' contention, which has led to the rupture of negotiations with the distributors, will require a full and reasoned answer. For it is they who are asked to bear the whole cost of the reduction in price to consumers. The burden is entirely to be placed on them, the distributors taking no share. Here, again, consumers may remember what the Linlithgow report said. It declared that the middlemen's charges for distributing milk were too high, and should be reduced; the trade obtained too much 'for purely pivotal and regulatory services.' Though it is a year and four months since that dispassionate inquiry was held, it is certain that nothing has happened to farmers to diminish their expenses; on the other hand, their wages bill may well increase, and linseed cake is considerably dearer than it was two years ago. It must not be thought that the farmers are unwilling to sell milk as cheaply as they can, or that they do not know the value of a copious milk supply to the public; but they feel that they cannot accept a lower rate than that which ruled last year. If the consequence of their accepting diminished profits—were they to accede to the proposal—were a diminished milk supply, not only would the object of the distributors presumably be defeated, but the public would have to go short of milk. Many of the farmers could turn their attention from milk producing to meat growing, as indeed some farmers in arable districts already are doing. Milk-selling, it is true, has its advantages, and farmers have reaped benefits by their dealings with such organisations as the United Dairies through the receipt of ready money and in other ways; but the absence of bad debts can be purchased too cheaply in view of the high risks which are inseparable from the maintenance of a milking herd. Nor is the production of surplus milk at the present terms profitable to the farmers. Whatever convenience the basic system may offer, it is often counterbalanced by the irritation it produces; a simpler system would aim at eliminating it. Here, however, farmers perhaps have the remedy more in their own hands than they sometimes recognise. The output of milk is often greater than can be sold at the higher price—namely, that which is obtained for liquid milk. While the yield from a herd is never so consistent as to enable a margin to be dispensed with, it might be possible to put surplus milk to better uses, as in rearing calves or making cheese, than to sell it at the lower factory prices.

"Seeing the issues involved in this breach between the farmers and the dairies, the public will rightly expect a reasoned justification of the distributors' proposals. The National Dairy Federation renders an important national function, in which the farmers have participated, and it is capable of performing a still greater service with the large organisation which it has at its disposal. But it would be doing the public no service to put such pressure upon the farmers as would result in a diminution of the milk supply. Here the public has the most direct interest in the present dispute. If the supply of milk were reduced, not only would the daily amount consumed grow less—with undesirable results to public health—but the price would rise in proportion. The risk attending a reduction of milch herds is greater than is commonly supposed; for if herds should ever be reduced or given up, farmers would not readily replenish them or form new ones."

Evolution of a New Breed of Cattle.

"The experiment of evolving a species of cattle able to forage for themselves and at the same time supply the best quality meat is, says *The Live Stock Journal*, being attended with success at Buffalo Park, Wainwright, Alberta, under the ægis of the Department of Agriculture of the Dominion of Canada. During the past hundred years many experiments have been made both in the United States and in Canada, with the view of producing crosses or hybrids between the buffalo and domestic cattle. Long before then, it is said, experiments in the same direction were made by the Spaniards in Mexico, and other countries, but, if such is the case, no records are available to show whether they were successful or not. Mention is made in the report of a Committee of the House of Commons on the Hudson's Bay Company in 1857 of a former experiment in Virginia, but the first authentic record is that which appeared in an article in the *American Magazine* of January, 1909, showing the success obtained some years before by one, Charles Goodnight, of Starlight, in producing fertile crosses between buffalo and Polled Angus cows at Paladuro, North Texas. The next successful effort was made by the late Mr. Mossam Boyd, of Bobcaygeon, Ontario, who managed to raise a herd of twenty hybrids after twenty-one years' endeavour. The plan of procedure adopted by Mr. Boyd was that in the interbreeding work domestic cows constituted the foundation female and pure-bred buffalo bulls the foundation males. The offspring of these were called hybrid buffalo. This was the initial experiment. The second consisted of crossing the hybrids with pure-bred animals of both buffalo and domestic cows, the offspring being known as three-quarter buffalo, one-quarter buffalo and one-eighth buffalo, as the case might be, and the result of the third experiment, breeding hybrids with hybrids, was known as 'cattalo,' the name being made up of the first four letters of the word cattle and the last three letters of the word buffalo.

"On Mr. Boyd's death, in 1915, the Department of Agriculture of the Dominion of Canada purchased the herd of twenty hybrids and cattalo, and up to this time no Government, either in the Old World or the New, had made any attempts at raising a cross-bred between buffalo and ordinary cattle. The herd was transferred to the Dominion's Experimental Farm at Scott, Saskatchewan, and early the next year it was moved to a specially prepared enclosure adjoining Buffalo Park at Wainwright, 125 miles east of the City of Edmonton, in the Province of Alberta, where the animals are under the direct control of the Dominion Parks Branch of the Department of the Interior. Owing to the many changes of environment and the lack of fertility in the bulls, very little success was registered in the first few years, but in 1919 the cows settled down with calf under a somewhat different plan to that followed by Mr. Boyd. At Wainwright, the plan adopted was the following: Hybrid and cattalo cows were sired by buffalo bulls, but as the bulls had an aversion to associate with these females, this part of the experiment was not further pursued. The next experiment was made by serving hybrid and cattalo cows by domestic bulls. In this case an excellent specimen of Hereford sire was used with very apparent success. The third experiment was made by serving domestic cows by hybrid buffalo bulls. The cows used in this instance were excellent high grade Shorthorns, Angus and Hereford. The fourth experiment was made by serving domestic cows by Yak sires.

"These experiments promise to be of very considerable economic value in the West and North of Canada. The advantages are many. The first is the prime quality of the beef the cattalo yield. Like the buffalo, they carry the greater part of their flesh along the back, thus differing considerably from domestic cattle, and the quality of the meat is better. The pelt, or hide, is similar to that of the buffalo in thickness of hair, quality and durability, consequently it is warm and suitable for robes, which is a consideration in view of the prevailing high prices of furs. The objects of the experiments are thus to permanently fix the type and fertility of the cattalo. The chief difficulty encountered in all previous attempts was, of course, the infertility of the hybrid males, and the object of the Canadian Government experiments at Wainwright Park has been to overcome this difficulty and produce an animal that will prove to be of economic value to the country. It is now confidently anticipated that a breed of cattle of the utmost importance to the human race will be reared, and on account of the less cost of feeding they will be put on the market at lower cost. As it is the animals are good grazers and able to forage for themselves. They require no winter shelter. They face storms rather than drift before them. It is also said they are immune from many, if not all, of the diseases which attack cattle. They thus retain the buffalo characteristics of ruggedness, 'rustling' for food, and endurance in a rigorous climate, and have many other qualities which make them useful animals to man."

French Bloodstock and Staying Power.

"The many successes of French horses in some of the important races decided in this country has given students of horse-racing and horse-breeding much food for thought. The assertion that certain eminent supporters of the British Turf are considering the advisability of introducing a French bloodstock strain into our stud lends colour to the theory that the principle of breeding in the British Isles may not be quite as perfect as might have been thought. Results show that something exceptional has contributed to the achievements of French horses, and, while the superiority of the British thoroughbred in certain directions is beyond dispute, the fact remains that in decisive manner our leading thoroughbreds have been defeated by horses bred and trained on the other side of the Channel.

"The art of breeding by blended strains is a particularly complex one, and the element of luck cannot be left out of account, but while the British product is quite capable of holding its own in the shorter races, it has become apparent that there is something at fault in the production of those staying qualities which are essential to success in the long-

distance events. In this respect the French breeder would seem to excel.

"There are several contributory causes to the success which has attended the efforts of French owners and trainers in some of the chief events decided in the course of the racing season in this country. To begin with, in France the younger horses are not raced so early as they are here, and this gives them a longer time in which to mature, while their training, as they grow older, is, if anything, of a more strenuous character than we adopt. Opinions may differ as to the respective merits of the two policies, but it is often held that no good can be done by placing any severe strain on a young undeveloped horse.

"But while this may be a contributory cause of our comparative failure, there remains the striking fact that French breeders have at their disposal a strain which has enabled them to produce a type of stayer.

"The achievements of French-bred horses cannot be gainsaid, and students of bloodstock breeding have bent themselves with all seriousness to the task of finding the particular blood quality which seemingly imparts great staying power.

"Over a long period any one strain is liable to be overlooked in its general value to breeding, and this, it would seem, is precisely what has happened in relation to British stud work. It is now realised that France is in possession of a certain strain of blood which has had much to do with the successes of last season and this. British breeders are alive to the importance of this fact, and some British horses will be mated with French bloodstock. Remarkable to relate, there is the strongest reason to believe that this particular strain was in use in this country possibly three-quarters of a century ago, but with the growing desire for a faster type of horse, this breed has been slowly lost sight of, and has seemingly long remained in comparative disuse.

"This fact has caused much more interest to be taken in the methods of French bloodstock breeders to produce a type of real stayers. It has now been made clear that in some respects many of our best thoroughbreds, while they represent the highest type of racehorse over shorter, are lacking in certain qualities in the longer-distance races. Such research will be of infinite value to the development of the British thoroughbred, and is calculated to give a fillip to horse breeding generally."—*Sunday Observer.*

Cancer in Animals.

At the Australasian Association for the Advancement of Science Congress at Adelaide, Dr. Sydney Dodd, of the Veterinary Section, dealt with cancer in domesticated animals, and said he regretted that the veterinary profession had not been invited to co-operate with medical men in cancer research work. Results, he said, were more likely to be achieved by team work than by individual effort.

NOTES AND NEWS.

The Editor will be glad to receive items of professional interest in these columns

The 10 a.m. from Euston last Saturday carried a party of thirty-two to Aberdeen. The L.M.S. railway very considerately put on a large dining saloon and reserved it entirely for members travelling North. The twelve and a half hours spent on the journey passed pleasantly enough in conversation and bridge, while the meals were excellently served, a special menu (with the name of the Association printed on the card) being supplied.

* * * *

The weather promised to be fair, but mist of the Scottish variety prevailed at Aberdeen, followed by heavy rains, and at the time of writing there is just the possibility that conditions may improve and make our stay more pleasant. Everyone arrived somewhat tired and looking forward to a good night's rest, except one member and his wife, who most unfortunately lost their luggage. After two days of ceaseless enquiry by wire and 'phone the straying property has now been restored to its owners. This member (who shall be nameless) showed wonderful patience under very trying circumstances, and everyone was relieved to know that his visit to Aberdeen has not been spoiled.

* * * *

The President thought he would like to take a tram ride round the town on Sunday, and so boarded the first tram and settled down to see the sights and enjoy himself. He asked the conductor how long the ride would take, and was informed, to his surprise, "only about five minutes, as the tram only goes just round the Square!" He hopes to have better luck next time.

* * * *

It is rather a gay crowd that gathers at the Palace Hotel in the evening, and the Scotch accent predominates. The serious business starts to-morrow, and given fine weather everything promises to go off remarkably well. No one has yet felt the cold sufficiently to have recourse to thermos flasks of "Birse Tea." So far one Scotch bonnet and one (small) bagpipes have appeared, and though members seem to prefer plus fours and fancy stockings, we still have hopes that some will be brave enough to affect the kilt.

* * * *

In the heading of the "Note on Canine Distemper," by A. S. Schlingman, which we published on August 30th, we omitted to state that the Research Laboratories, Detroit, were those of Messrs. Parke, Davis and Co. We believed that this was so well known to the members of our profession that it was scarcely necessary to mention the fact.

Pasteur Institute Ape Farm.

"The Pasteur Institute has," says *The Times* medical correspondent, "set up in the island of Los, near Konakri, in French Guinea, a 'farm' for the breeding and preservation of apes and monkeys required for medical experimental purposes. This is a large, well-watered, woody, and fertile tract of land near a forest inhabited by chimpanzees and several species of monkeys. A director has been appointed, and the necessary outbuildings constructed. These include accommodation for sick animals. The *Tropical Diseases Bulletin* remarks that chimpanzees are the 'most suitable of our relatives for pathological study.' They are also capable of affording material for experimental psychology. The baboons are far less easily managed, but very intelligent.

"There are many human diseases, including measles, scarlatina, typhus, yellow fever, and influenza, which cannot be transmitted to ordinary experimental animals (rabbits, guinea-pigs, etc.). The study of these must be abandoned altogether unless the 'nearest relatives' of man can be utilised. Thus the effort of the Pasteur Institute is likely to lead to important results."

"Sleepy Sickness" Mystery.

Experiments on Animals.

The study of *encephalitis lethargica* ("sleepy sickness"), which is now proceeding in many countries, has, says *The Times* medical correspondent, afforded certain results which are of a suggestive nature. The recent literature is fully reviewed in the current number of *Medical Science*.

It would appear that a form of *encephalitis* (inflammation of the brain) is common among rabbits and mice. It is due to a parasite which has been discovered, and bears no relation to the true *encephalitis lethargica*. Thus the reported "successful transmissions" of the human disease to these creatures must fall under doubt, since the possibility that the animals merely developed the parasitic form of *encephalitis* cannot be excluded. Further doubt of a similar kind now attaches to the presumed transmission of *encephalitis lethargica* to monkeys.

On the other hand, it has been fully confirmed that fluid taken from herpetic spots (other than those of "shingles") contains a poison which, when inoculated into rabbits and other domestic animals, gives rise to inflammatory conditions of the brain. This experimental disease differs from the parasitic disease of the animals. It remains, however, a question whether the poison obtained from the herpetic spots has anything in common with the causative agent of true *encephalitis lethargica*. Thus the mystery of this "new disease" remains, so far, unsolved.

CORRESPONDENCE.

Letters to the Editor should reach the Office not later than by the first post on Tuesday morning for insertion in following Saturday's issue.

All correspondence must bear the name and address of the contributor for publication.

The Editor does not hold himself responsible for the opinions of his correspondents.

Obstetrics.

To the Editor of The Veterinary Record.

Sir,—The whole point of my observations on Mr. Davis's article under the above heading was that, in the breech presentation, safe delivery by traction only should be regarded as the "rare exception," and only in carefully-selected cases.

Mr. Davis now says that, in the presentation described, delivery by traction "is nearly always possible and ought to be attempted." That is precisely where my experience differs, and where I think the danger lies of traction being even tried indiscriminately. In Mr. Davis's case there were the *obvious indications* that traction was a correct procedure; the tail being "visible at the vulva" shows, I think, that the fœtal pelvis was not far off, and that the cow's unaided efforts had nearly "done the trick," as proved by the short time required to complete the whole case.

Where traction is adopted, may I suggest that, instead of passing a hook up the rectum, a couple of transverse slits in the skin of the post-lumbar region, with blunt corded hooks inserted, would be quicker and simpler, and gives even two-sided traction.

Mr. Davis need not envy my asserted facility in femoral amputation, for it is simplicity itself, provided you have the right disarticulating hook. Given this, and a little modicum of experience, Mr. Davis would, I think, soon say of this simple operation, as Punch's famous tramp said of Pear's soap, "Since when I have used no other."—Yours faithfully, Edward P. Edwards.

Veterinary Surgery,
Grosvenor Road, Mold,
August 31*st*, 1924.

The Veterinary Officer of Health.

To the Editor of The Veterinary Record.

Sir,—Mr. Henry Sumner, in his recent address at the R.S.I. Congress, at Liverpool, very sensibly pleaded for an abandonment of the compound term Veterinary Inspector, and I have been surprised that other influential members of the profession have not taken the matter up.

The term *inspector* conveys to the minds of most members of the community the idea of someone who inspects drains, tram tickets or income tax returns, and calls up the image of brass buttons and a peaked cap—every association of the term is the antithesis of a professional one.

The medical authority in any town or county is known as the Medical Officer of Health; and the M.O.H. would

certainly look at you if you dubbed him *inspector*. The veterinarian who holds a public appointment under a health committee *is* a Veterinary Officer of Health, and if the title were adopted, he would soon be known colloquially as the V.O.H., a thoroughly comprehensive and satisfactory abbreviation.

It is suggested that the N.V.M.A. should be called the B.V.A.—analogous to the B.M.A. of medical men—that would be a step in the right direction. Should the Association decide to move so far, let it then deal with this matter of the designation of veterinarians holding public appointments. If the matter is taken up seriously, I think that they will find many towns more amenable than they imagine. The new appointment at Birkenhead was designated "veterinary officer," so the example has been set once at any rate.

Many members may ask, "What's in a name?" In answer, I would say, "a very great deal." A little exaggeration may stress the point. No sane man would christen his offspring *Algy* and expect him to develop into a second Gladstone—not even a third-rate Gladstone—because he would only develop into an Algy, or pine away at the thought on reaching mature years.

Of course, the Ministry of Agriculture should set the example in the case of its own staff. In regard to the Ministry, a rather amusing incident recurs to my mind. While acting as a temporary veterinary inspector for the Ministry some little time ago, I had occasion to address a police official who happened to be standing by with his sergeant. I addressed this official as "inspector." When the "inspector" had driven away, the sergeant came up to me and said, "Excuse me, sir, but I thought I had better tell you that you have been addressing my superintendent as 'inspector'; as he is a good sort he won't mind, but *inspector* is a lower rank than *superintendent*." The irony of it! I thanked the sergeant for his friendly tip.

If the profession is going to wait until Government Departments do the right thing in matters of this sort affecting status, it will wait quite the major part of this century.

I trust that the matter will now be brought before our Association Council.—I am, Sir, yours, etc., A. W. HOLTUM.

10 Arno Road, Oxton, Birkenhead,
3rd September, 1924.

[This matter has already been before a Committee of the Association. The change of title would necessitate fresh legislation to supplement the Public Health Act, 1875.—ED.]

Milk Distribution Dangers.

TO THE EDITOR OF THE VETERINARY RECORD.

Sir,—Mr. Hugh Begg's paper read before the Sanitary Congress was an admirable one, and I am in agreement with your remarks as to the inadequate discussion that followed. Surely better arrangements might be made, otherwise there is no incentive to an essayist to bring valuable material before such a meeting.

The paper showed what great advancement the conditions under which milk is produced during the last decade, but all this effort is lost if the distributor is not equally alive to the dangers of contamination when delivering. As an example of this, I would like to quote the following:—About 7 o'clock one morning, a few weeks ago, I had occasion to leave home for an early train, and in a turning close to my house I saw a milk vendor filling up the bottles from the churn, taking a disc from his pocket to put on the top. These bottles were stained with the previous day's milk and evidently gathered from the doorsteps *en route*. This man was, no doubt, a vendor in a small way, and therefore his stock of bottles was insufficient. One can picture this milk being given to infants whose parents probably pay an increased price, and feel, in all innocence that they are giving their children the best and purest diet. In this case I would rather have preferred it from the churn.—Yours truly, J. WILLETT.

7 Harley Place, Harley Street, N.W.1,
September, 1924.

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